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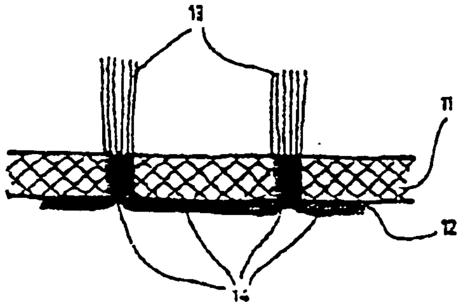
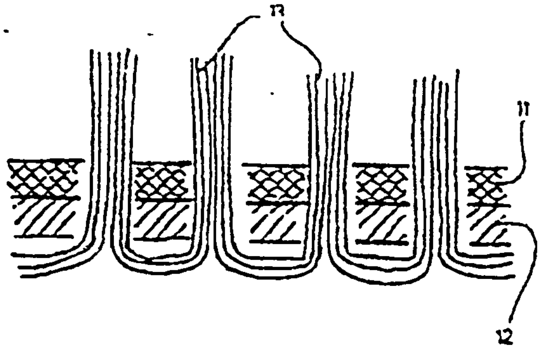
(54) Carpeting and Process for its Manufacture

(57) The facing of conventional floor covering is set by a primer coating on a woven or nonwoven fabric serving as a support. Drying the primer coating costs time and energy.

The invention's floor covering uses thermoplastic fibers instead of a primer coating to adhere the facing to the support.





The following statements are from documents filed by the applicant.

The invention involves a floor covering, a carpet, a wall-to-wall carpeting, or the like having a filament facing or a pile and a support bonded thereto, especially by tufting. Furthermore, the invention involves a process for making floor coverings, carpets, wall-to-wall carpeting, or the like.

The above-cited type of carpeting usually comprises a facing bonded to a support. The support can be a woven fabric, a nonwoven fabric, or the like. As the facing is usually bonded to the support by tufting, the support is also spoken of as a nonwoven backing for tufting. The facing comprises fiber or filament tufts bonded with the support, the tufts being loops for loop goods or cut for velour goods. The facing is also designated as the pile.

The facing must be fixed in the support (pile-setting). Also, individual fibers must not be removable (filament-locking). For this purpose, a primer coating, specifically a synthetic resin or latex dispersion, has long been applied and dried on the back side of the intermediate product comprising facing and support. Finally, a conventional foam backing or a textile secondary backing is applied.

Applying and drying the primer coating consumes much time and energy. Therefore, the problem involved in the present invention is to make a floor covering with less time and energy expenditure.

The invention's floor covering is characterized in that the support is bonded with the facing by a melting and cooling process to set the pile and lock the filaments and in that (initially) meltable and hardened components are present in the support area for this purpose. The basic concept of the invention comprises, accordingly, replacing the conventional primer coating by the introduction or supplying of a meltable material. The latter bonds the facing with the support in the desired manner. Energy consumption and hardening time are indeed required for this purpose. However, these are clearly lower than the drying energy and/or time required for making conventional floor coverings.

The support comprises advantageously a blend of conventional materials, for example, polypropylene or polyester, and thermoplastic adhesive yarns. The meltable material is thus a direct component of the support. Handling is therefore especially simple. The meltable material bonds the filaments together (filament-locking) and at the same time, adheres the fiber tufting to the support (pile-setting).

In an embodiment of the invention, a thermoplastic fiber nonwoven fabric can be needled onto the front or back side of the support. This enables, in particular, the use of a conventional support.

Finally, a textile secondary backing can be applied with the aid of meltable components within the support or within an additional layer (thermoplastic fiber nonwoven fabric). This can be accomplished in the same operating step that also sets the pile and locks the filaments in place.

Other features of the invention, also from the standpoint of the invention's process, are given in the claims.

Advantageous embodiments of the invention are described in more detail in the following with the aid of the figures. These are:

Figure 1 - a cross-section of the invention's floor covering showing the various layers and the fiber tufts in a first stage of manufacture, that is, after tufting and before heating.

Figure 2 - the floor covering of Figure 1 after heating, that is, after pile-setting and filament-locking.

The invention's floor covering and a process for its manufacture are explained in the following with the aid of Figures 1 and 2. Figure 1 shows a support comprising a blended nonwoven 11 of conventional fibers and thermoplastic fibers. Below this is a thermoplastic fiber nonwoven fabric 12. A facing is tufted on the superposed nonwovens 11 and 12, which are bonded together by needling. The resulting fiber tufts are designated in the figures as 13. Tufting means that fiber tufts are pulled back and forth through both layers. The loops formed in tufting are cut on one side, that is, on the side of the blended nonwoven fabric 11 (support) to form a velour structure.

After tufting, the floor covering made as in Figure 1 is heated, for example, by passage over a hot plate or by infrared heating. This softens the thermoplastic fibers in the blended nonwoven fabric 11 and in the thermoplastic fiber nonwoven fabric 12. The molten material flows into the cavities within the fiber tufts and between the blended nonwoven fabric 11 and the fiber tufts 13. Molten and hardened material 14 is shown by black areas in Figure 2. The layer of the thermoplastic fiber nonwoven fabric 12 is thinner than in Figure 1. The resulting floor covering is cooled, optionally by passage over a cooling roller. As a result, the fiber tufts - the facing and/or the pile - are bonded firmly with the support and/or the blended nonwoven fabric 11 (pile-setting). Simultaneously, the fiber tufts are bonded internally (fiber-locking). Individual fibers can no longer be pulled out.

The nonmeltable fibers of the blended nonwoven fabric are preferably of a polyester, polyamide, or polypropylene. The meltable fibers can comprise, for example, polyesters capable of being melted.

A woven fabric can be used instead of a nonwoven fabric. Also, a simpler embodiment can have only a blended nonwoven fabric or blended woven fabric without an additional thermoplastic fiber nonwoven fabric. Finally, instead of a blended nonwoven fabric, a conventional nonwoven or woven fabric, that is, without thermoplastic components, can also be processed with an additional thermoplastic fiber layer. For example, thermoplastic fibers can be needled above and below into a conventional layer.

A backing is usually applied to the support, for example, a foam backing or a textile secondary backing. The latter can be adhered in one operating step during the bonding of the facing with the support. The thermoplastic fibers of the blended nonwoven fabric or the thermoplastic fiber nonwoven fabric thus simultaneously effect adhesion with the backing.

Number reference list

11 - blended nonwoven fabric
12 - thermoplastic fiber nonwoven fabric
13 - fiber tufts
14 - hardened material

Patent Claims

1. Floor coverings, carpets, wall-to-wall carpeting or the like having a facing and/or a pile of filaments (fiber tufts 13) and a support bonded thereto, particularly by tufting, characterized in that the support is bonded with the facing by a melting and cooling process to set the pile and lock the filaments in place and in that initially meltable and hardened components are present for this purpose in the area of the support.

2. Article according to Claim 1, characterized in that the support is made as a tufting base nonwoven fabric and/or woven fabric from a blended nonwoven fabric (11) and/or blended woven fabric of conventional material and meltable material, the latter in particular comprising thermoplastic fibers and/or thermoplastic adhesive yarns.

3. Article according to Claim 1 or 2, characterized in that the support is prepared from a preferably needled combination of blended nonwoven fabric (11) and/or blended woven fabric and thermoplastic fiber nonwoven and/or woven fabric, or a combination of conventional nonwoven fabric and/or woven fabric and nonwoven fabric and/or woven fabric containing thermoplastic fibers.

4. Article according to one or more of Claims 1 to 3, characterized in that a secondary backing, particularly textile, is applied under the support (blended nonwoven fabric 11) or optionally under the additional layer (thermoplastic fiber nonwoven 12), the secondary backing being bonded with the overlying layer by the adhesive action of the meltable components, additives, or fibers of the overlying layer.

5. Process for making floor coverings, carpets, wall-to-wall carpeting or the like, whereby a facing and/or a pile (fiber tufts 13) of filaments is first bonded by tufting with a support (blended nonwoven fabric 11), characterized in that setting the pile or locking the filaments is accomplished by a melting step in the area of the support, and in that, for this purpose, the support has appropriately meltable components or additives, or is provided with an additional layer having appropriately meltable components or additives.

6. Process according to Claim 5, characterized in that a thermoplastic fiber nonwoven or woven fabric is needled into the upper or lower side of the support of woven fabric or nonwoven fabric of conventional material or of a blended woven fabric or blended nonwoven fabric (11) of conventional material and meltable material especially before tufting.

7. Process according to Claim 5 or 6, characterized in that a backing, especially a textile secondary backing, is applied simultaneously during the melting step.

8. Process according to Claim 7, characterized in that the backing is adhered thermally to the overlying layer by means of meltable components or additives in the support, the additional layer, or the backing itself.

Translation: Language Services
Philip M. Levin, S.P., Sci-Tech Translation Service
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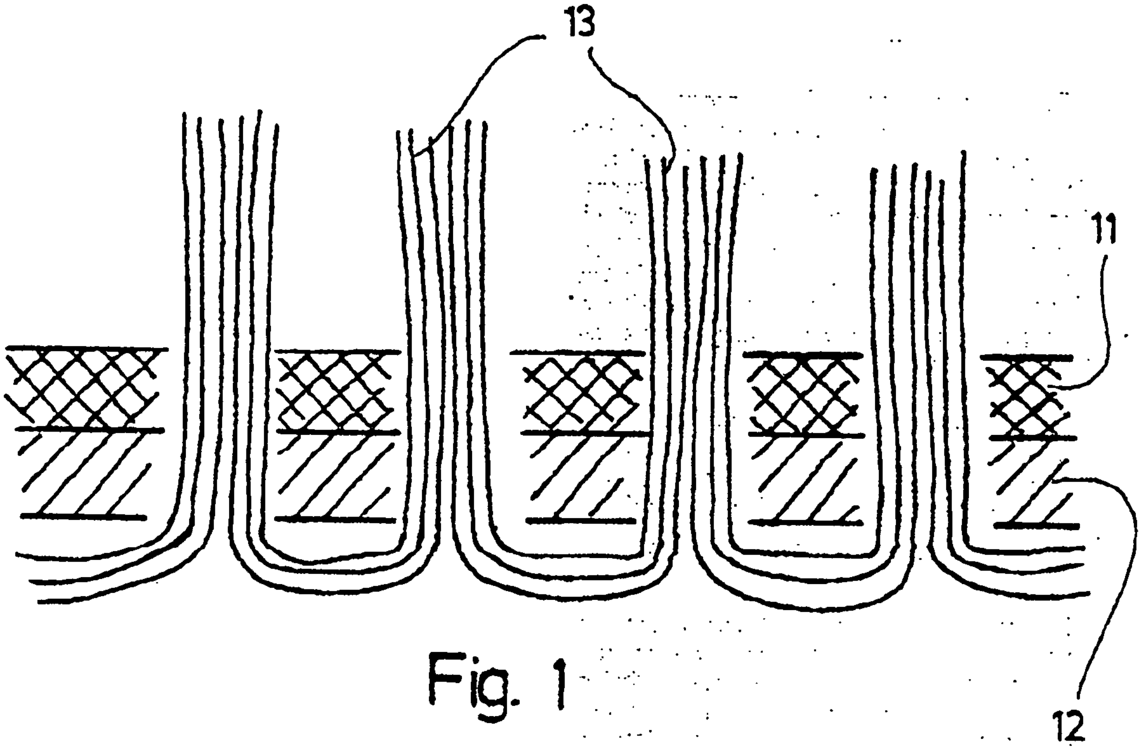

Fig. 1

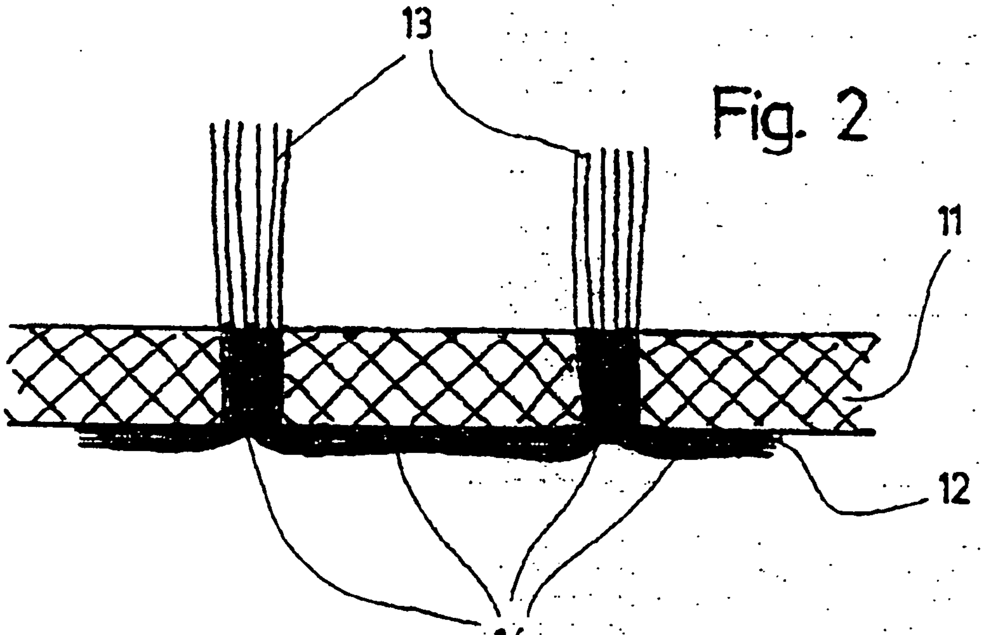

Fig. 2